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ON THE MODIFICATIONS OF THE APEX IN MUREX.

BY FRANK C. BAKER.

The embryonic apex in this group consists of from one to one and a quarter (in one instance of two and a half), polished, unvarixed whorls, which are either rounded or carinated, and are generally provided with a distinct varix at the ending of the embryonic whorl. The tip of the apex is in many of the species a little depressed and bent down on one side, and the top of the embryonic whorl is, with one exception, that of *Murex scolopax* Dillw., always rounded. The embryonic whorl is in some species sharply carinated, in others rounded with a thread-like carina, and in not a few it is simply rounded. The varix at the ending of the embryonic whorl, may be either triangular, rounded, large or scarcely visible; the presence of this varix indicates, without doubt, the point where the shell began its independent existence after leaving the egg.

The carina, when present, begins about midway of the whorl, and after traversing the whorl in an oblique direction finally terminates in the suture above the whorl below, or is continued in the lowest spiral thread of the succeeding whorl. The whorls succeeding the embryonic are generally rounded and provided with from nine to thirteen small, rounded longitudinal ribs, which in turn are usually crossed by four fine spiral threads.

In comparing specimens with the following descriptions, they should be held with the varix of the embryonic whorl toward the left hand. The aperture of the shell is no guide, inasmuch as each turn of the shell brings the apex in a different position.

In the present communication I have restricted my observations to the typical *Murex*, or *Tribulus* group.

The only author who has described the apices of *Murex*, so far as known to me, is Watson, who, in the Report on Gasteropoda of the Challenger Expedition, has given valuable remarks on several of the species treated below, as well as some others.

Genus **MUREX** Linn.

Subgenus MUREX (Sensu stricto).

Murex scolopax, Dillw. (Fig. 1).

The embryonic nucleus consists of two smooth, glossy fulvous whorls, of which the second is twice as large as the first; a carina begins at the apex and after traversing the first and second whorls in an oblique direction, finally ends in the suture above the third whorl. The top of the first whorl is flat; the lateral outline of the whorls descends outwardly in a straight slant to the carina, and from the carina to the suture below it slants inward. The carina of the last whorl is much lower, nearer the suture than that of the first, giving the two whorls somewhat the appearance of a stumpy smoke-stack of a locomotive.

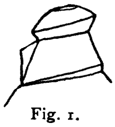

Fig. 1.

The last nuclear whorl ends with a triangular varix where (presumably) the shell began its growth after leaving the egg ; this varix is thick, whitish and semitransparent; from this point the shell continues to be nodulous until the spinose varices appear upon the fourth whorl; the suture between the first and second embryonic whorls is very distinct. There are ten longitudinal ribs to each whorl until the varices appear upon the fourth whorl.

This species is separated from *Murex occa* Sowb., by the top of the first whorl being flat instead of round, as in the latter species. The varix is triangular and well developed in *scolopax,* whilst in *occa* it is rounded and not so well developed. It is separated from *Murex tribulus* Linn., by the lateral outline of the second whorl being straight instead of rounded as in the latter species.

Murex occa, Sowb. (Fig. 2).

The embryonic nucleus consists of two nearly white, smooth whorls; the first is a little rounded knob, and the second is distinctly carinated and about twice as large as the first; the carina commences about midway of the first embryonic whorl and continues in an oblique direction until it finally disappears in the suture above the third whorl; the lateral outline of the first whorl is rounded while that of the second is carinated as in the first whorl of *scolopax.* The carina of the second whorl is about midway of the whorl. Looking at the whorls from above they are seen to increase regularly, the succeeding whorl being twice the size of the one before it.

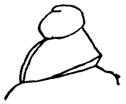

Fig. 2.

The last apical whorl ends with a small thread-like varix; from this varix the whorls are nodulous until the spinose varices appear upon the fourth whorl; there are nine ribs to each whorl until the spinose varices appear ; the suture between the first and second embryonic whorls is quite deep; the apex is a little flattened or immersed, and bent down on one side.

This species is separated from *Murex tribulus* Linn., by the first whorl being not so compressed, the carina not so near the suture below, and in the terminal varix being low, inconspicuous and not triangular.

Murex tribulus, Linn. (Fig. 3).

The nucleus consists of about one and a half glossy, horn-colored whorls; a carina begins at the apex and continues round the apical whorl until it finally disappears in the suture above the second whorl; the lateral outline of the first part of the whorl descends outwardly in a straight slant to the carina, and from the carina to the suture below it slants inward; the outward slant is three times the length of the inward slant; the lateral outline of the second part of the whorl descends outwardly in a slight curve to the carina, and from the carina to the suture below it slants inward. The carina is situated but a short distance above the suture of the whorl below, almost concealed by the following whorl.

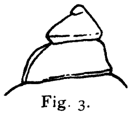
Fig. 3.

The apical whorl ends with a small thread-like varix; from this varix the whorls are nodulous until the spinose varices appear upon the third whorl; there are nine ribs to each whorl until the spinose varices appear; the suture between the first and second whorls is a little impressed.

Separated from *Murex occa* Sowb., by the carina being nearer the suture below and by the varix being slightly shouldered instead of rounded as in *occa*. The lateral outline of the whorl is convex in *tribulus* whilst in *occa* it is straight.

Murex rectirostris, Sowb. (Fig. 4).

The embryonic nucleus consists of about one and one-fourth, smooth, polished, rounded whorls; a carina begins after about one-half a whorl, traverses the whorl in an oblique direction, and finally runs into the lowest spiral line of the succeeding whorl; the lateral outline of the whorls shows a more or less rounded appearance; the carina runs just above the suture of the whorl below; the top of the whorl is rounded. The last apical whorl ends with a distinct, well-devoloped, horn-colored varix, succeeded by three rounded, high whorls of slow increase, each crossed by about fourteen small, rounded ribs, and having four spiral cords; the spinose varices appear upon the fifth whorl; the suture between the embryonic whorls is impressed.

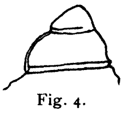
Fig. 4.

Separated from *Murex recurvirostris* Sowb., by the more oval outline of the first part of the first whorl and by the carina being nearer the suture in the latter species. It is also more depressed in form than that species.

Murex brevispina, Lam. (Fig. 5).

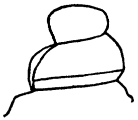

Fig. 5.

The nucleus consists of one and a half rounded, polished, brownish whorls, of which the first part is a little rounded knob becoming larger and acquiring a sharp spiral carina which encircles its base; the carina begins about midway of the whorl, and finally runs into the lowest spiral line of the succeeding whorl. A lateral view shows a rounded outline; the top of the whorl is rounded; the tip is a little depressed.

There is no decided varix at the end of the embryonic whorl; the ribs of the succeeding whorls commence abruptly and continue until the spinose varices appear upon the third whorl; there are about ten small, rounded ribs to each whorl. These whorls are shouldered and have a spiral thread below the shoulder; the sutures are distinct.

This species is separated from *Murex nigrispinosus* Reeve, by the whorl being more depressed.

Murex nigrispinosus, Reeve (Fig. 6).

The embryonic nucleus consists of about one and a half polished, rounded whorls; the first is a little rounded knob, and the second is

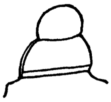

Fig. 6.

provided with a fine, thread-like carina close to the suture below; the lateral outline of the whorls descend outwardly in a curve to the carina, and from the carina to the suture below it slants inward in a straight line; the second whorl is but little higher than the first.

The last apical whorl ends with a thread-like varix, after which they are succeeded by about two unarmed, high, unvarixed, rounded whorls of slow increase, each crossed by thirteen small, rounded, longitudinal ribs and scored by four fine, spiral lines; the spinose varices appear upon the fourth whorl; the suture between the first and second embryonic whorls is distinct.

Separated from *M. brevispina* Lam., by its more elongated form and less impressed suture.

Murex ternispina, Lam. (Fig. 7).

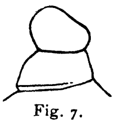

Fig. 7.

The nucleus consists of one and a half brown whorls; a carina begins near the end of the last embryonic whorl and runs into the lowest spiral thread of the succeeding whorl; this carina is a very faint thread and is scarcely noticeable unless looked for very closely; the lateral outline shows a very decided rounded appearance; the extreme point of the embryonic whorl is a little depressed and bent down on one side.

There is no varix at the end of the embryonic whorl; the succeeding ribs commence gradually even before the end of the embryonic whorl, and slowly increase in size until the spinose varices appear upon the fourth whorl; there are nine ribs to each whorl and these are crossed by four fine, spiral lines; the suture between the embryonic whorls is impressed.

This species is separated from its congeners by the presence of a thread-like carina near the ending of the embryonic whorl.

Murex tenuispina, Lam. (Fig. 8).

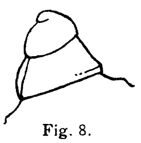

Fig. 8.

The embryonic nucleus consists of two faintly yellowish-white whorls; the carina is quite close to the suture of the whorl below and is almost concealed.

The varix at the end of the nucleus is small and rounded; this is followed by close set, rounded ribs which continue until the spinose varices appear upon the fourth whorl; there are nine of these ribs to each whorl crossed by four fine, spiral lines; the suture between the embryonic whorls is impressed.

This species is separated from *Murex brevispina* Lam., by the less rotund outline of the first embryonic whorl and by the outline of the second being straight instead of rounded as in *brevispina.*

Murex recurvirostris, Sowb. (Fig. 9).

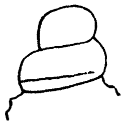

Fig. 9.

The nucleus consists of about one and a half rounded, polished, brownish whorls, of which the second part is but little larger in outline than the first; a lateral view of the outline shows a rounded appearance; the top of the first part of the whorl is rounded; the tip of the embryonic whorl is depressed and a little bent down on one side; a carina commences near the last half of the apical whorl and runs into the lowest spiral thread of the succeeding whorl.

The varix at the end of the embryonic whorl is scarcely larger than the succeeding ribs; after the varix the whorls continue to be nodulous until the spinose varices appear upon the fourth whorl; there are about thirteen small, rounded ribs to each whorl, crossed by four spiral threads; the suture is impressed.

Separated from *Murex rectirostris* Sowb., by the more rounded outline of the first part of the embryonic whorl and the absence of the shoulder upon the second part.

Murex similis, Sowb. (Fig. 10).

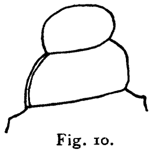

Fig. 10.

The nucleus consists of one and a half whitish, smooth, rounded whorls; the lateral outline shows a rounded appearance; the first part of the whorl is a little rounded knob.

A sharp and well-defined varix appears at the end of the embryonic whorl, and this is followed by a number of high, rounded ribs, which cease at the appearance of the spinose varices upon the fourth whorl; there are thirteen of these ribs to each whorl crossed by four fine, spiral lines.

This species is separated from *Murex ternispina* Lam., by the absence of the thread-like carina near the ending of the embryonic whorl. The sutures are not so deep as in the latter species.

Murex tryoni, Hidalgo.

Upon examining this shell I was much surprised to find that it had an apex identical with that of the preceding species. This may prove to be but a variety of *M. similis* as was thought by Dr. Dall.

Murex cailleti, Petit.

The embryonic apex of this species is identical with both *similis* and *tryoni*. I have not been able, through lack of perfect specimens, to examine the apex of the typical *motacilla* of Chemnitz.

Murex adunoospinosus, Beck. (Fig. 11).

The nucleus consists of 2½ blunt, conical, glossy, fulvus, flat-sided whorls, which increase regularly from the apex; the last whorl is margined below by a very fine thread just at the suture; the lateral outline shows a cone of about two regularly increasing whorls, of which the second is twice as large as the first.

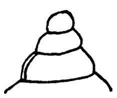

Fig. 11.

There is a rounded varix of considerable size at the end of the last embryonic whorl after which they are nodulously ribbed until the hollow spines appear upon the sixth whorl; these are crossed by four fine, thread-like spiral lines; the sutures of the embryonic whorls are distinct. This is the largest apex of the *Tribulus* or typical *Murex* group.

The present species differs wholly from all the other members of this group in having two and one-half whorls instead of one as in those hitherto described. The whorls are of a glassy texture, a feature not possessed by the other members of the group.